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None

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UK CL (Edition J) A3B, F4W  
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(54) Foot warming apparatus

(57) A foot warming apparatus comprises a frame member 2 received in a recess 17 of the heel portion 11 of a shoe, boot or like article of footwear, the frame member 2 received cotton asbestos 23 which is arranged to be ignited by means of electrical ignition means 4, 45, 24, 25, 26. The cotton asbestos 23 is in communication with fuel absorbent cotton surrounding frame 2 such that fuel introduced and absorbed therein is supplied to the cotton asbestos 23 as it burns. The burning cotton asbestos 23 warms the shoe, boot or other like article of footwear which in turn warms the foot located therein.

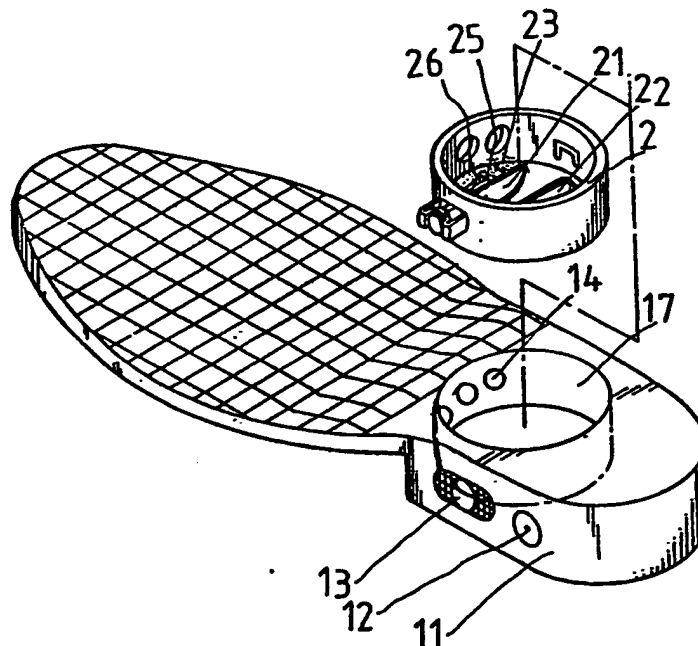


Fig. 2

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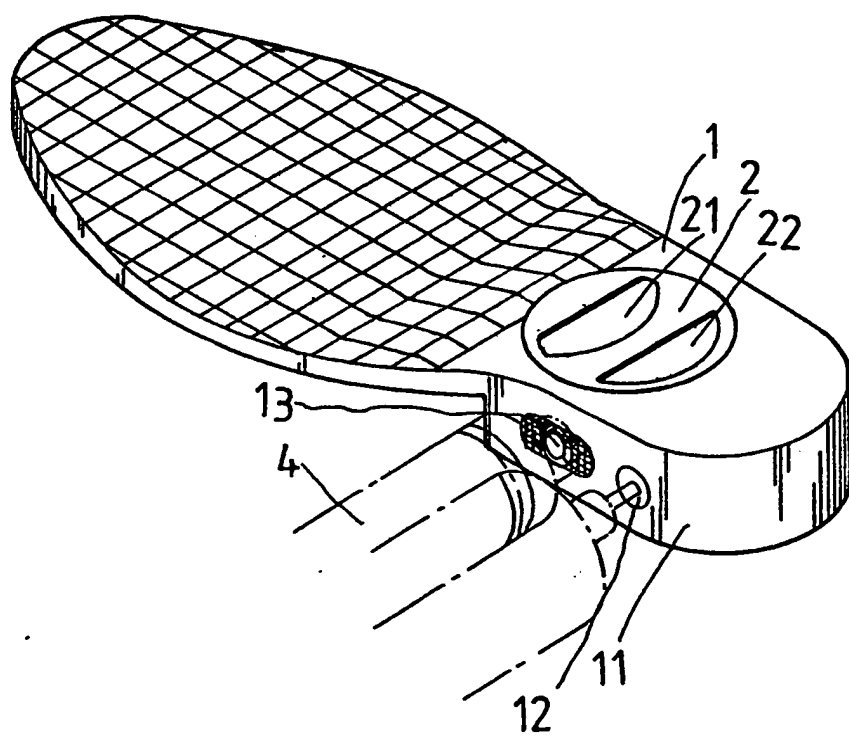


Fig. 1

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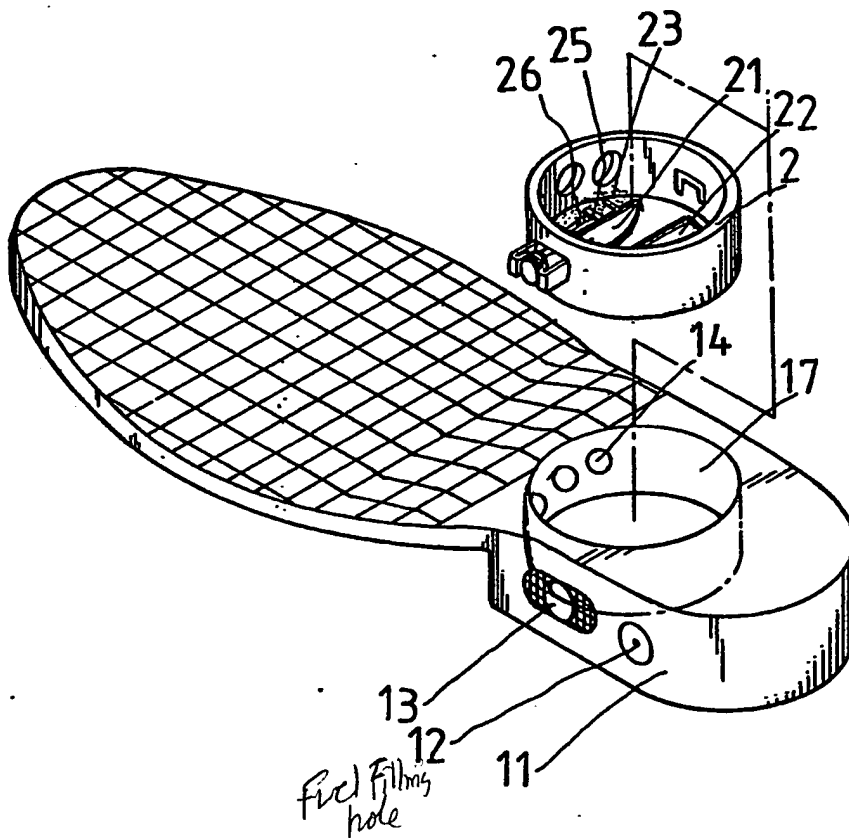


Fig. 2

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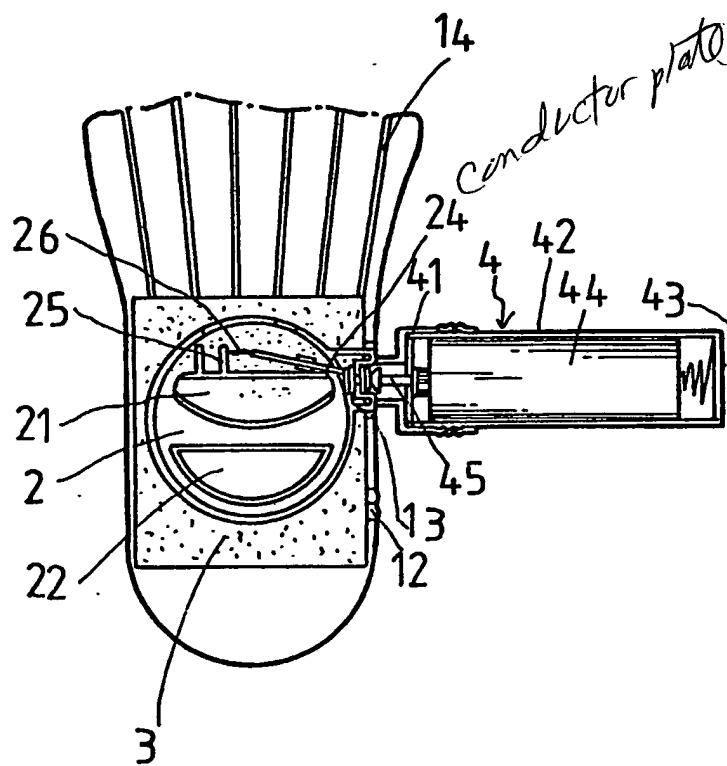


Fig. 3

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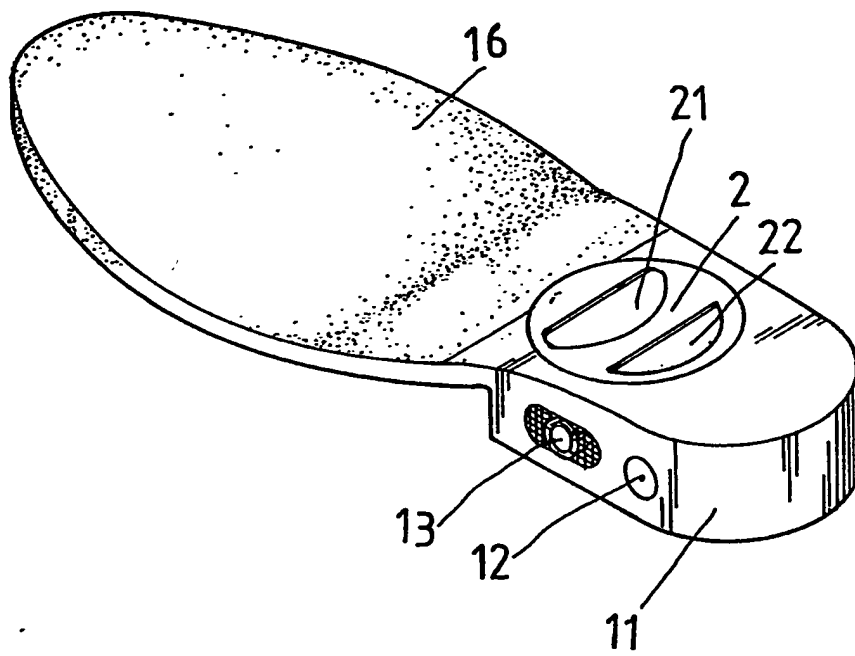


FIG. 4

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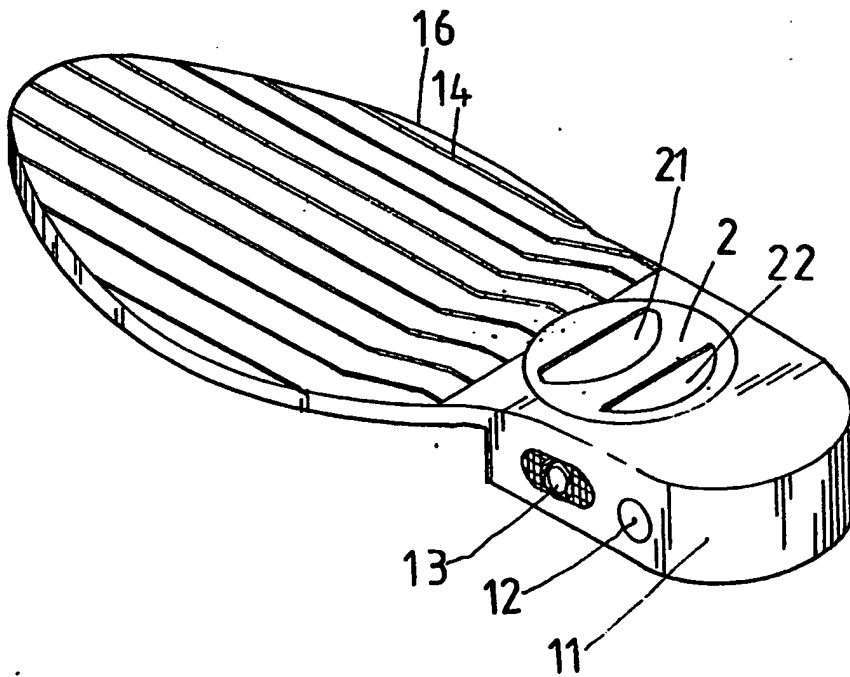


Fig.5

FOOT WARMING APPARATUS

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The present invention relates to apparatus for warming the human or animal foot.

10 In cold weather people take many precautions to protect the human body against the low temperatures experienced. When indoors, a hot air stove or hot air fan may be used to regulate the ambient temperature. However, when outside, people often wear a variety of thick articles of clothing for example hats, gloves, socks and heavy jumpers and coats. However, there is  
15 currently no effective means for keeping the feet warm particularly when outdoors in low temperatures.

Since the feet are located at one end of the body, blood circulation to the feet is more ineffective and so the feet tend to suffer from the cold weather more  
20 than other more central regions of the body. Since the feet are often in motion, it is important that they are protected from the effects of cold weather.

The present invention seeks to provide means for warming the human or animal foot, in particular so that  
25 the foot can remain warm when located out doors in low temperatures.

According to one aspect of the present invention there is provided foot warming apparatus for reception in a cavity in a heel portion of a shoe, boot or other  
30 footwear, the apparatus comprising a frame for receiving asbestos material and an electrical ignition element for igniting the asbestos material, and a body of absorbent material for reception of fuel, whereby when the frame and absorbent material are received in  
35 the cavity with the asbestos material in communication

with the absorbent material, and the electrical ignition element is energized from outside the footwear by an ignition device, the asbestos material draws fuel from the absorbent material.

5       The electrical element may comprise a tungsten filament electrically connected to contact means of the ignition hole. As such, the ignition hole may be arranged to receive a battery ignition means for making electrical connection to the frame member and the  
10       electrical element. The heating of the electrical element then causes the ignition of the asbestos material.

          The frame member may comprise a circular frame member.

15       Further, the shoe, boot or other footwear may include at least one strip, groove or heat conduction sponge so as to facilitate the conduction of heat thereabout.

~~The frame member may comprise apertures for~~  
20       enhancing air circulation.

          According to another aspect of the present invention there is provided foot warming apparatus comprising a circular frame housing cotton asbestos material in which a tungsten filament is located, which  
25       filament has its ends respectively connected to a conductor column integrally raised from the circular frame and to a centre conductor column which is isolated from the circular frame by two insulator gaskets to prevent a short circuit, the circular frame  
30       includes two semi-circular slots for air circulation, a shoe or boot having a circular trough for receiving the circular frame and having an ignition hole and a fuel filling hole at one lateral side thereof, the fuel filling hole having received therein absorbent cotton  
35       material connected to the cotton asbestos when the

circular frame is mounted on the circular trough, wherein liquid fuel can be filled through the fuel filling hole for absorption by the absorbent cotton so as to constantly supply the cotton asbestos, and the tungsten filament can be heated by means of battery ignition process to burn the cotton asbestos so as to produce hot air to the shoe or boot.

The invention is described further hereinafter, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of the foot warming apparatus embodying the present invention;

Fig. 2 is a fragmentary structural view of the apparatus of Fig. 1;

Fig. 3 is a sectional view of the apparatus of Fig. 1;

Fig. 4 is a perspective view of apparatus according to another embodiment of the present invention; and

Fig. 5 is a perspective view of apparatus according to yet another embodiment of the present invention.

Referring to Figs 1 and 2 a shoe sole 1 having a circular trough 17 formed in the heel portion 11 thereof is provided and a circular frame 2 located therein. A lateral side of the heel portion 11 includes a fuel filling hole 12 and a battery ignition hole 13. The circular frame 2 receives cotton asbestos 23 and is also formed with two curved slots 21, 22 for enhancing air circulation about the frame and shoe.

With reference to Fig. 3, the fuel filling hole 12 is provided for the introduction of fuel into a cavity in the heel portion 11 and the battery ignition hole 13 is provided for the electrical connection of ignition means with the circular frame 2. When a battery

ignition means 4 is connected to the battery ignition hole 13, a tungsten filament 26 which is set in the circular frame 2 to connect the cotton asbestos 23 to the battery ignition hole 13, will be energised so as to burn the cotton asbestos 23. The cotton asbestos 23 is in communication with absorbent cotton 3 located in the cavity 3 of the heel portion 11 of the shoe. Liquid gas or fuel which is introduced into the cavity in the heel portion 11 is absorbed by the absorbent cotton 3 and when the cotton asbestos 23 is burnt, the gas or fuel is continuously delivered thereto.

The battery ignition hole 13 is connected to a circular frame 2. When in use, a battery ignition assembly 4 is connected into the battery ignition hole 13 such that the negative end thereof is in electrical contact with the circular frame 2 and the positive connection of the battery ignition assembly 4 is separated from the negative connector by an insulator 31 so that a conductor plate 24 and a ground connection plate 25 contact the cotton asbestos 23. Thus, the tungsten filament 26 which is set between the conductor 24 and the cotton asbestos 23 will be heated to burn the cotton asbestos 23. The air heated by means of the burning cotton asbestos 23 will be further induced into vent holes 14 so as to pass out of outlets (not shown) so as to constantly keep the shoe sole 1 warm.

According to the invention, the battery ignition assembly 4 comprises a housing 42 having a conductor spring 43 at one end thereof and contacting a battery 44. An upper cap 41 is connected to the housing 42. The positive terminal of the battery 44 is connected to a conductor rod 45 and the negative terminal of the battery 44 is connected to the upper cap 41 by way of the conductor spring 43. When in use, to ignite the cotton asbestos 23, the positive terminal of the

battery is connected to the conductor plate 24 by way of the conductor rod 45, and the negative terminal of the battery is connected to the circular frame 2 by way of the upper cap 41.

5        Fuel is supplied to the absorbent cotton 3 by inserting a nozzle of a fuel reservoir in the fuel filling hole 12 such that liquid fuel can then be dispensed into the cavity in the heel portion 11 and so absorbed by the absorbent cotton 3.

10        With reference to Figs 4 and 5, there is shown an alternate form of foot warming apparatus constructed according to the present invention. Features of Figs 4 and 5 which are common to the apparatus of Figs 1-3 have been given the same reference numerals. The shoe  
15        sole 11 again houses a circular frame 2 and is provided with a fuel filling hole 12 and a battery ignition hole 13. However, a sole portion 16 of the shoe has a strip-like or netted groove or grooves, or a heat conduction sponge so as to facilitate heat conduction  
20        through the whole structure of the shoe sole so as to efficiently keep the shoe constantly warm.

      The invention is not restricted to the details of the foregoing embodiments. For example, the invention could be incorporated in a shoe or boot or any solid  
25        article of footwear for a human or animal.

CLAIMS

5        1. Foot warming apparatus for reception in a  
cavity in a heel portion of a shoe, boot or other  
footwear, the apparatus comprising a frame for  
receiving asbestos material and an electrical ignition  
element for igniting the asbestos material, and a body  
10 of absorbent material for reception of fuel, whereby  
when the frame and absorbent material are received in  
the cavity with the asbestos material in communication  
with the absorbent material, and the electrical  
ignition element is energized from outside the footwear  
15 by an ignition device, the asbestos material draws fuel  
from the absorbent material.

2. Apparatus as claimed in claim 1 wherein the  
ignition device makes electrical connection with the  
frame and electrical ignition element.

20        3. Apparatus as claimed in claim 1 or 2, wherein  
the electrical ignition element comprises a tungsten  
filament.

4. Apparatus as claimed in any preceding claim,  
wherein the frame member comprises a circular frame.

25        5. Apparatus as claimed in any preceding claim,  
wherein the sole of the shoe, boot or other like  
footwear is formed with at least one strip, groove or a  
portion of heat conduction sponge for facilitating heat  
conduction about the shoe.

30        6. Apparatus as claimed in any preceding claim,  
wherein the absorbent material comprises cotton.

7. Foot warming apparatus comprising a circular  
frame housing cotton asbestos material in which a  
tungsten filament is located, which filament has its  
35 ends respectively connected to a conductor column

integrally raised from the circular frame and to a centre conductor column which is isolated from the circular frame by two insulator gaskets to prevent a short circuit, the circular frame includes two semi-  
5 circular slots for air circulation, a shoe or boot having a circular trough for receiving the circular frame and having an ignition hole and a fuel filling hole at one lateral side thereof, the fuel filling hole having received therein a mass of absorbent cotton  
10 connected to the cotton asbestos when the circular frame is mounted on the circular trough, wherein liquid fuel can be filled through the fuel filling hole for absorption by the absorbent cotton so as to constantly supply the cotton asbestos, and the tungsten filament  
15 can be heated by means of battery ignition process to burn the cotton asbestos so as to produce hot air to warm un the shoe or boot.

8. Foot warming apparatus substantially as hereinbefore described with reference to and as  
20 illustrated in Figs 1-3, Fig. 4 and Fig. 5 of the accompanying drawings.